

newly brought from shore, nor could I easily perceive, it had any relicks of its late corruption.

That the Testicles of the Animal called strong of Musk, as Mr. *Josselin** saith, is most certain: For, I have known some of them kept a long time in ones pocket, till they were become hard and black, and yet smelt as strongly as at first, which, in my opinion, was nothing inferior to the scent of that, which is commonly sold for *Musk* in the shops. I remember, that one of our Seamen, being laid to sleep too near the fire-place, with one of these dried Testicles in his pocket; it happen'd that a coal burn'd through breeches and all to it, and made so great a scent of musk, that he might easily have been smelt a good way off, and the fire might perhaps have advanced where there was a worse perfume, had not the strength of this awaken'd the man, and so made him withdraw his breech in time. This Animal deserves to be further inquired into, especially if what Mr. *Theuenot* relates be true, *viz.* That *Musk* is nothing else but the Testicles of a beast like a Deer, found in the province of *Honan*, as 'tis noted in *Numb.* 14. *p.* 250. of your *Transactions*.

Musk-quash do smell

*See the account given of it in *Numb.* 85. *p.* 5024. of these *Tracts*.

Extract of a Letter, written to the Publisher by Mr. Leewenhoeck from Delft, April 21. 1676; Concerning the Texture of Trees, and some remarkable discovery in Wine; together with some Notes thereon. *

* The Numeral figures in the margin and body of this Letter refer to the like figures in the Notes made thereon.

S I R,

*M*onsieur *Constantin Hugens* of *Zulichem* was pleased to shew me the *Comparative Anatomy of the Trunks of Plants*, written by Doctor *Grew*, and told me, that he had very ingeniously and learnedly discoursed upon that subject; though I, by reason of my unskilfulness in the English Tongue, could have little more than the contentment of viewing the elegant Cuts.

I have formerly written unto you, *viz.* in my Letter of *August 15 1673.* that I had discovered in several Trees (1.) two sorts of vessels or pores, and did conceive, that the matter which serves for the increase of Trees was in (2.) the greater vessels sent upwards, and that some small particles did again descend in the smaller Vessels to the roots, whereby was maintained a (3.) Circulation also in Trees. 1.
2.
3.

But not finding by the figures of Dr. *Grew*, that he hath discover'd those (4.) two sorts of Vessels in the wooddy part, I here take 4.
the

the liberty of sending you the Eight part of the transverse Slice of an Ash-sprig of a years growth; and shall withall acquaint you, that besides those two sorts of Vessels in wood, I have discover'd a(s) third sort; these two going directly upward, and this

5. third issuing out of the middle or the pith, going horizontally

6. to the circumference: So that the(6) whole body of Wood hither-to viewed by me, consists of nothing but of small hollow pipes.

These pipes, out of which the firm wood is made up, are in

7. many places as(7) clear as crystal, and in other places, methinks, I

8. see them to consist in part, of (8) small globuls. The great Vessels, observ'd and exprested by Dr. *Grew*, were seen by me very manifestly to consist of small globuls. These great Vessels are generally furnish'd with small membranes, which being cut through, may be seen to lye obliquely in the Vessels; and these I conceive to be

9. (9)valves.

10. (10) These three sorts of Vessels then, I have observ'd not only in *Ash*-wood, but also in *Elme*, *Oak*, *Willow*, *Shumaok*, *Lime-tree*, *Apple*, *Pear*, *Plum*, *Walnut*, *Hasel-tree* &c. And all the Vessels, which Dr. *Grew* hath represented in *Ash* and other wood, though they differ from one another in bigness, yet, under favour, I take them

11. to be(11) of one sort. And though I have some Observations which I keep yet to myself, yet this which concerns the three sorts of pores or Vessels I am willing to communicate unto you, as I also have shew'd them here to divers curious persons that were pleased to visit me; to whom I have also made it out, as well as I could, how

12. Trees and other Plants do grow in height and thickness,(12) of which I doubt not but Dr. *Grew* hath written so learnedly that I shall not need to discourse of it here.

Tab:II. *Fig. 1.* A B is one of the great pores or Vessels of an *Ash* twig of one years growth, cut longways the little twigg, through the

13. middle of the pores; which Vessel consists of (13) transparent globuls, where-in you may plainly see the small oblique membrans

14. by me (14) cal'd valves, which membrans do not ly with their upper part extended one and the same way, but they lye so as that two sides of them with their upper end reach towards one another, as CC. and DD. And if we suppose, that the hollowness of these greater Vessels is as large as a hair of ones head, we may then very well say,

15. that the hollowness(15) of the small ones is at least 25 times smaller

16. than such a hair. That these Vessels(16) consist of globuls, I have not only seen in *Ash*-wood, but also in *Walnut*, *Hasel*, *Apple*, *Pear*, and *Plum*, trees &c.

Fig. 2. A B exhibits some of the small Vessels that make up the (17) firm wood, cutt of close to the Bark longways, likewise of an Ash 17. of one years growth, between the pipes of which these Vessels are found; which have their rise out of the pith of the plant or twig, and are, as I conceive, increased by more Vessels, either out of the great or small Vessels that go directly upwards. (18) Of these Vessels 18. there lie 8. 10. or 12. together, crowded in long-ways between the aforesaid pipes, as at C and D, in the manner of a Weavers-shuttle, lying in some piaces irregularly, the one close by the other, and in other places somewhat more dispersed.

Fig. 3. A B C D is (19) the Bark of the Twig, which I have only 19. represented with bare lines, because that now the plant is growing, Tab. II. whereby the Bark is changed from what it is in Winter. And if one would give a p^{re}cise and exact delineation hereof, it would be requisite to observe it a few night together whilst it is growing. And this might likewise be done with the *Wood*.

A B H D E G F is the Eighth part of the *Wood* of an Ash twig, one year old, cutt transversly; wherein you may see, that it is not made up wholly of firm or close parts, but partly too (20) of great 20. Vessels, which yet differ much among themselves in bigness, and which are not at all, or seldom, perfectly round, standing also near the pith in some places irregularly one another; and the rest of the Wood being an infinite number (21) of little Vessels or pores. 21.

(22) G H, are Vessels having their origin from the Pith, and terminating in the circumference of the Woody part, I mean, when the Tree is not growing. (23) These Vessels may not always be seen, 23. in a transverse Cut, to have their rise out of G, and to end in the circumference H, because that in the dissection made with the knife you do not throughout keep just the middle of the body that takes hold of these Vessels, from the place of the very beginning of them, but in one place, as about C in *Fig. 2.*, you will cut through with its sharp point, and in another place the same will pass with its middle, as at D, where it is thickest; and so it comes to pass, that your eye sees these Vessels to have their beginning out of G, and run between G and H into nothing, and again, that the same do seem to have their beginning in the middle, and become still broader and broader, until they end in H.

I. I. Are (24) the very small Vessels that are counted to be the 24. year Wood, and which require indeed to be more curiously designed; but to express them in their natural perfection and order, just as they lye by one another, in my opinion, can never be done by the hand of Man. Qqqqq E K

E K F Is the *Pith* of the twig, which likewise cannot be imitated by art, forasmuch as it consists of Vesicles or (25) bladders that have 6. 7 or 8 sides, and lye most curiously with their sides to one another: In some of which bladders I have seen small (26) darkish globuls; and if I had not in some other Wood more plainly discovered these globuls, it would have been impossible for me to have 27. observ'd them in this Pith by reason of their (27) extraordinary sinfulness.

I beg your favour, Sir, to communicate this to Dr. *Grew*, with my service to him, and to inquire of him, whether he hath seen as well as I, whether the great Vessels or pores, that are express by him in his figures, do not consist of globuls, as in *Fig. 1.* A B; as also that in the same do lye oblique membranes or films, by me call'd valves, as C C. D D; again, whether the particles of the Wood, which encompass the great Vessels, be not all of them very small Vessels or pores; lastly, whether the strokes, which in *Fig. 3.* are denoted by G H, coming out of the pith, and running horizontally to the circumference, do not also all of them consist of Vessels or pores; as these ab. 2. also, which in *Fig. 2.* are cut off along the Wood, and run through the said Vessels, as C D? An answer to which particulars I should be very glad to receive from the said Doctor.

I have now some *French* Wine of the growth of the year past, which hath a very delicate taste. The Vessel, wherein this Wine is, was very good and sweet when the Wine was put in, and a coarse linnen Cloath dipt in melted Brimstone and kindled had been hung over the Vessel before it was filled. In this Wine I have divers times observed small living Creatures, shaped like little Eels, as ap. 15. pears in *Fig. 4.* A B, having on their forehead a round convexity like a crescent, without having any thing else, that I could see, on the forepart of their body, and that part looked no otherwise than crystal; but towards its middle it was made up of nothing but globuls, which I could very plainly discern; and the hinderpart of the body of these little Animals appeared as clear and transparent as the fore-part, and running to a very sharp tayl. These creatures I have kept in my Study for a whole month swimming in Wine. And though they move strongly, yet they make but little way, whereof the cause may be, that they are quite destitute of leggs.

Some Notes on the foregoing Letter.

These Observations, as to the Texture of Plants, although they (and very many more) have been already made and published by Dr. *Grew*, and by Sign. *Malpighi*; yet because that (for the most part) they may

may be a further Confirmation of the truth of their Observations; I thought it not unuseful to have them communicated here also. And withal, to subjoin to the principal Passages hereof, the following Remarques.

1. two sorts of Vessels] These two sorts of Vessels are described by Dr. Grew in his first and general Anatomy of Plants, in his Anatomy of Roots, and in his Anat. of Trunks.

2. in the greater Vessels sent upwards] The chief use, whereto Dr. Grew, in his said 3 Books, assigneth these Vessels in all parts, is not the conveyance of Sap, but of Air. And herein Sign. Malpighi doth agree with him. See him in his Anatome Plantarum de part. Caulium componentibus. Yet in some few Plants, and at some certain times of the year only, Dr. Grew sheweth, that the said Air-Vessels do contain an Aqueous Sap; and how it comes to pass, see his Anat. of Trunks p. 2. Ch. 1. and pag. 26.

3. a Circulation] Dr. Grew in his aforesaid first Book speaketh conjecturally of a Circulation; not in the Trunk, but in the Root only: And that not by Vessels of a different, but the same Species, sc. Sap-Vessels; some whereof running through the Pith, by which chiefly the Sap may ascend, and some through the Bark, by which part of the Sap may descend. See Ch. 2. of that book.

4. two sorts of Vessels in the Woody part] These two sorts of Vessels are, as was said, distinctly and largely described by Dr. Grew; as you will find particularly in his Anat. of Trunks p. 22. to 30. And the Explications of all the Figures do plainly distinguish the Air-Vessels from the Sap-Vessels. The pores, or mouths of which Sap Vessels, are for their incomparable smallness, represented only in figure the 18, where they are very much wider than ordinary. See also p. 25. of that Book.

5. a third sort —— going horizontally] These parts, which Mr. Leeuwenhoeck calls a third sort of Vessels, Dr. Grew calls the Insertions, and hath largely described them in all his 3 Books; particularly, in his Anat. of Trunks, p. 20, 21, 22; and hath clearly expressed them in almost every figure of that Book, sc. by white diametral lines (more agreeable, as he conceiveth, to Nature) which Mr. Leeuwenhoeck (Fig. 3. G H.) hath expressed by black. These parts ^{Tal} be demonstrateth, especially from Herby Plants, to be of the very same substance with the Pith. Wherein Sign. Malpighi doth also most clearly agree with him: See his Idea Anat. Plant. p. 3 l. 3.

Of these Insertions it is by Dr. Grew further remarked, that they consist of a number of most exquisitely small Fibres; which in all less Woody, softer and younger Plants, are Woven up together into ext ^{ram}

*small Bladders: Which Bladders, Sign. Malpighi hath likewise observed, calling them *uriculos*: See him in the forecited place: But note, their being composed of such Fibres. These Bladders, being (in cleaving a Branch) many of them cut open, Dr. Grew tells me, he conceiveth, may be taken by Mr. Leewenhoeck for the Mouths of Vessels. But in most hard Woods, the Bladders he saith, are scarcely to be seen; the said Fibres being so closely couched and drawn up together, as to lye rather after the Manner of the Vessels in the Liver, Testicles, Glands, and other Viscera in Animals.*

6. the whole body of Wood — consists of Pipes] Dr. Grew hath formerly gathered upon probable grounds, that not only the Wood, but that the whole of a Plant, doth consist of Pipes. See his Anat. of Roots. part. 2. Ch. ult. and Anat. of Trunks p. 18. and p. 34. 35. See also the latter Paragraph of the Note 5

7. as clear as Crystall] The same Dr. Grew hath said in his Anat. of Roots, p. — 114.

8. of small Globul's] Dr. Grew hath given a further and more particular Description of the Structure of these Vessels; Anat. of Roots p. 89. and Anat. of Trunks p. 30 and fig. 24. Which, if well minded, will give you the reason, why they seem, especially in Vines, Oak, and some other plants to consist of Globul's

9. Valves] Of the same appearance of pithy Valves, Dr. Grew maketh mention in his first book of the Anatomy of Plants p. 71. at the beginning,

But that in the Sap Vessels there are no Valves, he proveth by divers arguments: See his Anat. of Trunks p. 45, 46. The same person doth also acquaint me, that he hath made some experiments, whereby he proveth, that there are no Valves neither in the Air-Vessels: Which I suppose he reserveth to be Published together with further Observations upon Plants.

10. these three sorts —] These three general Parts Dr. Grew hath, as is said, described and represented in several Figures, shewing the different Texture of so many several sorts of Wood. See Anat. of Trunks p. 20. to 30. compared with the Figures and the Explication of the same. But for what he saith of one of the said three parts, (which Mr. Lewenhoeck, calls a third sort of Vessels) see the Note 5.

11. of one Sort] Dr. Grew hath both described, and by his figures (Anat. of Trunks) represented two sorts of Vessels, in the Wood of Ash, and divers other Trees. But all these Vessels, whose pores or mouths are represented, are indeed of one sort only; excepting in the 18. Figure; which made Mr. Leewenhoeck (for want of skill in the English

lis tongue to have recourse to the explications,) to conceive, there were no other represented at all. And for Fig. 18, that being but one (which the Author thought sufficient for examples sake) amongst so many more figures, Mr. Leewenhoeck did, it seems, overlook it. See the latter end of the Note 4.

12. of which] The Causes of which, are assigned and explicated, in Dr. Grews Anat. of Trunks, part. 2. Ch. 5. And of a great many more particulars throughout the whole Occconomy of Vegetation in all the aforesaid three Books.

13. transparent Globuls] See the Note 8.

14. called Valves] See the Note 9.

15. of the Small ones] of the size of these Valves, see Dr. Grews computation, Anat. of Trunks p. 18. 19.

16. consist of Globuls] See the Note 8.

17. firme Wood] Dr. Grews Description whereof, see Anat. of Trunks, p. 22. to 26.

18. of these Vessells] See the Note 5.

19. the Barke] See Dr. Grews Description and Representation of the Bark in his Anat. of Trunks. And of this very Barke, fig. 15. with the Explication. And it is further to be noted, That the same Author, in his Anat. of Trunks, informeth us, that there are two sorts of Vessells Visibly distinct in the Barke of most, if not of all, sorts of Trees and other Plants, as well as in the Wood. Wherin Sign. Malpighi doth also agree with him, at least, that they are to be found in many Trees of two distinct species; see him in his Idea, p. 2. towards the end. And Dr. Grew. moreover, both observeth, and sheweth three distinct species of Vessells, even in the Barke, of some Plants. See Anat. of Trunks p. 14 to 17. and figures 19, 20, 21.

20. of great Vessells] Which Dr. Grew calleth the Air-Vessells, (Malpighius, Fistulas spirales) and describeth Anat. of Roots and Trunks p. 26 to 30.

21. of little Vessells] Which Dr. Grew calls the True Wood, or Old-Sap Vessells, described in his Anat. of Trunks p. 22 to 26.

22. GH the Vessells] See the Note 5.

23. these Vessells may not alwayes —— untill they end in H] See the same thing observed in Dr. Grews general Anat. of Plants. And an Example of the same in the Wood of Sumach, Anat. of Trunks Fig. 20; that being of a Branch of the first years growth, (as is Mr. Leewenhoecks,) wherein it is much more observable than in older Branches. The cause hereof is that which Dr. Grew calls the Braces, and Sign. Malpighi, the Superequitations, of the Vessells.

24. the very small Vessels] *The same with those mentioned Note 21.*

25. Bladders] *See Dr. Grews Description of the Pith, and therefore in these Bladders, Anat. of Roots part. 2. And Anat. of Trunks, part. 2. Ch. 4.*

26. darkish Globules] *See the same Ch. p. 34.*

27. Extraordinary smallnes] *See the same Ch. 32, 33 Note, that these Bladders, whereof the Pith consists, Sign. Malpighi doth also observe; but not the Fibres, of which Fibres (most admirably Woven up together) Dr. Grew hath discovered the said Bladders to be composed. See the same Ch. p. 35.*

Eclipsis Solis

Anno 1675, die 23 Junii mane st. n. observ.

G E D A N I,

à

Job. Hevelio.

Ute non omnes & singulas phases in hác Eclipsi, ab ipso initio, ob frequentissimas densissimasque Nubes hic Gedani observare nobis obtigerit; attamen præcipuas crescentes ex voto annotare licuit. Sol oriens clarissimus quidem extitit, sic ut ipsum initium admodum distin&è, hor. sc. 4. 44', deprehensum fuerit; paulò autem post, horâ sc. 5. 6' nubes Solem nobis planè eripabant, ut nihil quicquam adhuc usque 5. 32' deprehendere licuerit, ut ut vigiles semper oculos ad Tabulam observatoriam direxerimus. Ex improviso tamen præter omnem strem, horâ, ut dixi, 5. 32' nubes Solem rursus deserebant, ut ejus Phases omnes subsequenter, à 1 ad 23, uti ex Schemate liquet, accurate describere potuerim. Prior phasis ante maximam obscurationem adhuc annotata est; maxima namque obscuratio circa tertiam phasin, horâ videlicet 5.39'. primum incidit, prout pariter ex ipso typo videre est; Finis contigit hora 6. 33'. 30". Quantitas Eclipses observata est 6 digit. 42', ad 37' scilicet major, quam calculus Rudolphinus eam promiserat; imò Initium & Finis satis evidenter secundum dictum calculum in hac Eclipsi aberravit; quippe liquidum est, ad 12 integra ferè minuta tardius incidisse: Semidiameter quoque Lunæ calculo hác vice non respondet; siquidem circa hor. 5.55', alto scilicet Sole 15° ferè, Semidiam. Luna non nisi 14'. 37" extitit; cum tamen calculus eam 15'. 29" monstraverit, datâ nempe semidiametro Solis 15'. Hæc sunt, que observata in hác Eclipsi fuere.

Calculus Rudolphinus.	Observatio.	Differentia.
Hor.	Hor.	
Initium Gedani, 4 31 42	4 44 0	12
Maxima obscur. 5 28 20	5 39 0	11
Finis, 6 24 58	6 33 30	9
Duratio, 1 53 16	1 50 0	3
Quantitas, vj. digit. 5'	vj. dig. 42'	37

Fig. 3.

